

BOOSTER PUMP ASSEMBLY

- 1.1 A SIMPLEX WATER PRESSURE BOOSTER SYSTEM AS DESIGNED AND FABRICATED BY BARRETT ENGINEERED PUMPS (619) 232-1861. THE SYSTEM SHALL BE A COMPLETELY PREFABRICATED SYSTEM WITH PUMP, PIPING, ELECTRICAL AND STRUCTURAL ELEMENTS. THE ENTIRE BOOSTER PUMP ASSEMBLY SHALL BE UL LISTED AND APPROVED.
- 1.2 PUMP SHALL BE:
(CR SERIES) VERTICAL MULTI-STAGE CENTRIFUGAL. PUMP CONSTRUCTION SHALL BE CAST IRON STAINLESS FITTED WITH CAST IRON CASING, STAINLESS STEEL IMPELLERS AND BOWLS. PUMP SHALL BE EQUIPPED WITH TUNGSTEN CARBIDE MECHANICAL SEAL. PUMP SHALL BE DIRECTLY COUPLED TO A C-FACE ELECTRIC MOTOR.
- 1.3 ELECTRIC MOTOR SHALL BE OF THE SQUIRREL CAGE INDUCTION TYPE SUITABLE FOR FULL VOLTAGE STARTING. MOTOR SHALL BE ODP TO AID IN COOLING. ELECTRIC MOTOR SHALL BE RATED FOR CONTINUOUS SERVICE. THE MOTOR SHALL HAVE HORSEPOWER RATINGS SUCH THAT THE MOTOR WILL CARRY THE MAXIMUM POSSIBLE LOAD TO BE DEVELOPED UNDER THE DESIGNED PUMPING CONDITIONS AND NOT OVERLOAD THE MOTOR BEYOND THE NAMEPLATE RATING OF THE MOTOR. MOTOR SHALL HAVE A 1.15 SERVICE FACTOR. THE MOTOR SHALL CONFORM TO THE LATEST NEMA STANDARDS FOR MOTOR DESIGN AND CONSTRUCTION.
- 1.4 PUMP CONTROL PANEL SHALL HAVE A NEMA 4X PLAIN FRONT NON-METALLIC ENCLOSURE WITH PADLOCK LATCHES. THIS INCLUDES POWER AND CONTROL RE-SETTABLE THERMAL CIRCUIT BREAKERS, HEAVY DUTY MAGNETIC STARTER WITH ADJUSTABLE OVERLOAD PROTECTION, HAND-OFF-AUTO SWITCH TO SELECT MODE OF OPERATION, AND HEAVY DUTY NUMBERED TERMINAL STRIPS FOR POWER AND CONTROL WIRING LEAD TERMINATIONS.
- 1.5 METAL OXIDE VARISTOR PROTECTED PUMP START RELAY(S) INCORPORATED IN PANEL TO START PUMP WITH SIGNAL FROM EACH IRRIGATION CONTROLLER.
- 1.6 ALL SYSTEM PIPING SHALL BE TYPE "L" COPPER. ALL FITTINGS SHALL BE COPPER OR BRASS, WITH UNIONS OR FLANGES TO ALLOW FOR SYSTEM DISASSEMBLY OR MAJOR COMPONENT REMOVAL. SYSTEM SHALL INCORPORATE AN INTEGRAL FULL PIPE SIZE BYPASS LINE WITH ISOLATION VALVE TO ALLOW FOR PUMP REMOVAL AND REPAIR WITHOUT DISRUPTING WATER SUPPLY TO SYSTEM.
- 1.7 ISOLATION VALVES SHALL BE ALL BRASS QUARTER TURN BALL VALVES WITH HARD CHROME BALL ON LINES 2" AND LESS. ISOLATION VALVES SHALL BE LUG STYLE BUTTERFLY VALVES WITH BUNA-N ELASTOMERIC SEATS, DUCTILE IRON NICKEL COATED DISC, AND STAINLESS STEEL STEM WITH HANDLE AND 10 POSITION GALVANIZED MEMORY PLATE ON LINES 2 1/2" AND GREATER.
- 1.8 GAUGES SHALL BE 2 1/2" DIAMETER FACE, GLYCERIN FILLED WITH STAINLESS CASING AND BRASS INTERNALS.
- 1.9 FLOW ACTIVATED PADDLE STYLE MAGNETICALLY COUPLED FLOW SWITCH, SENSITIVE TO FLOWS AS LOW AS 1 FPS, MOUNTED ON PIPING AND INTERCONNECTED TO TIME DELAY RELAY TO SHUT DOWN PUMP ON NO-FLOW CONDITIONS, TIME DELAY RELAY ADJUSTABLE FROM 0 TO 5 MINUTES.
- 1.10 PUMP SYSTEM SHALL BE MOUNTED ON A STRUCTURAL ALUMINUM SKID WITH MOUNTING FLANGES ON FRONT AND BACK TO ALLOW FOR MOUNTING OF SKID TO CONCRETE PAD. SKID EQUIPPED WITH PIPE SUPPORT ON SUCTION AND DISCHARGE PIPING. ALL NUTS AND BOLTS AND WASHERS TO BE HEAVY ZINC COATED STEEL ON SKID AND PIPING. SKID SHALL INCLUDE MOUNTING HARDWARE FOR INTEGRAL ALUMINUM ENCLOSURE.
- 1.11 THE SYSTEM ENCLOSURE SHALL BE VANDAL AND WEATHER RESISTANT, MARINE GRADE ALUMINUM ALLOY 5052-H32 CONSTRUCTION WITH RECTANGULAR PUNCH-OUTS FOR VIEWING AND HEAT DISSIPATION. THE ENCLOSURE SHALL BE LOW PROFILE HINGED TOP DESIGN WITH PADLOCK PROVISION. THE COVER SHALL BE SECURED TO THE CONCRETE PAD WITH STAINLESS STEEL HARDWARE. THE ENCLOSURE SHALL MEASURE 30D" X 42U" X 40H" AND CONCRETE PAD DIMENSIONS SHALL BE 42" X 54" X 4".
- 1.12 PUMP ASSEMBLY SHALL INCLUDE THE FOLLOWING OPTION(S):

(VFD) WHERE SPECIFIED BY THE SYSTEM DESIGN PARAMETERS, A VARIABLE FREQUENCY DRIVE SYSTEM TO RECEIVE FEEDBACK SIGNAL FROM SYSTEM MOUNTED STAINLESS STEEL PRESSURE TRANSDUCER, AND IN CONJUNCTION WITH INTERNAL SOFTWARE DRIVEN PID CONTROL LOOP MAINTAIN CUSTOMER ADJUSTABLE CONSTANT SYSTEM DISCHARGE PRESSURE BY VARYING THE SPEED OF THE PUMP IN RESPONSE TO VARYING SYSTEM LOAD.

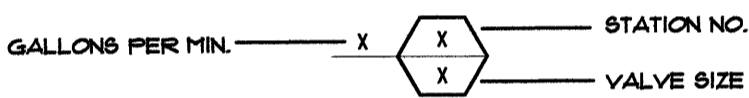
(T) WHERE SPECIFIED BY THE SYSTEM DESIGN PARAMETERS, A BLADDER STYLE PRESSURE STORAGE TANK, PIPED TO PUMP DISCHARGE, DESIGNED TO MAINTAIN SYSTEM PRESSURE WHEN PUMP IS OFF AND PROPERLY SIZED BY THE MANUFACTURER TO PREVENT SHORT CYCLING OF PUMPING SYSTEM.
- 1.13 THE SERVICES OF A FACTORY REPRESENTATIVE OR TRAINED SERVICE PROFESSIONAL SHALL BE MADE AVAILABLE ON THE JOB SITE TO CHECK INSTALLATION AND PERFORM THE STARTUP AND INSTRUCT THE OPERATING PERSONNEL. A STARTUP REPORT CONTAINING VOLTAGE AND AMPERAGE READINGS, SUCTION AND DISCHARGE PRESSURE READINGS, ESTIMATED FLOW CONDITIONS, AND GENERAL OPERATING CHARACTERISTICS SHALL BE SUBMITTED TO THE OWNER.
- 1.14 FOUR SETS OF OPERATING AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE OWNER AFTER STARTUP AND SHALL INCLUDE PARTS MANUALS FOR MAJOR COMPONENTS, PERFORMANCE CURVE FOR PUMP, GENERAL SEQUENCE OF OPERATION, AND ELECTRICAL SCHEMATIC FOR CONTROL PANEL.

IRRIGATION LEGEND

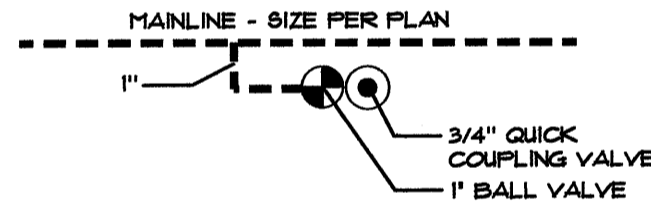
SYMBOL	MFG.	IRRIGATION COMPONENT DESCRIPTION	MODEL/PART NO.	MAX. RAD.	FRECIP. RATE	PSI	GPM	GPH	DETAIL REF.
①	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	PGS-ADV-4	34'	0.31	45	1.6		F / L-13
②	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	PGS-ADV-7	40'	0.47	45	3.4		F / L-13
③	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	PGS-36V-3	44'	0.60	45	5.2		F / L-13
④	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-90 (BODY=MFR40-00-SHRUB)	14'	0.45	40	.19		F / L-13
⑤	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-180 (BODY=MFR40-00-SHRUB)	14'	0.45	40	.37		F / L-13
⑥	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-360 (BODY=MFR40-00-SHRUB)	14'	0.45	40	.75		F / L-13
⑦	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-360 (BODY=MFR40-00-SHRUB)	20'	0.44	40	.40		F / L-13
⑧	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-180 (BODY=MFR40-00-SHRUB)	19'	0.45	40	.74		F / L-13
⑨	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-360 (BODY=MFR40-00-SHRUB)	19'	0.45	40	1.47		F / L-13
⑩	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-360 (BODY=MFR40-00-SHRUB)	30'	0.43	40	.86		F / L-13
⑪	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-180 (BODY=MFR40-00-SHRUB)	30'	0.45	40	1.82		F / L-13
⑫	HUNTER	ROTOR ON RISER 12" ABOVE GRADE	MP1000-360 (BODY=MFR40-00-SHRUB)	30'	0.45	40	3.64		F / L-13
	RAINBIRD	XERI-BUG EMITTER INSERT IN IRRIGATION LATERAL LINE PIPE (NON-PRESSURE)	XB-10PC 4 PFR-FRA-12 SCH. 40 PVC UVR	--	--	MIN. 20 MAX. 40		10	EJK / L-14 L / L-7

SYMBOL	IRRIGATION COMPONENT DESCRIPTION	MFG.	MODEL/PART NO.	REMARKS	DETAIL REF.
★	POINT OF CONNECTION			CONNECT TO STUB PROVIDED FROM EXISTING 10" WATER LINE PER CIVIL ENGINEER'S PLANS	--
☒	IRRIGATION CONTROLLER - 48 STATION IN STAINLESS STEEL ENCLOSURE W/ ANTENNA, COMMUNICATIONS CARD, AND TWO YEAR SERVICE TO RAIN MASTER CENTRAL SERVER	RAINMASTER	SA6-RM12-48/TY/PMR- CAC/RSE	INSTALL PER DETAIL AND MANUFACTURER'S INSTRUCTIONS CONNECT TO 110 VAC SERVICE PROVIDED BY EPC CONTRACTOR	E / L-13
☒	IRRIGATION CONTROLLER - 24 STATION IN STAINLESS STEEL ENCLOSURE W/ ANTENNA, COMMUNICATIONS CARD, AND TWO YEAR SERVICE TO RAIN MASTER CENTRAL SERVER	RAINMASTER	SA6-RM12-24/TY/PMR- CAC/RSE ASSEMBLED IN A STRONG BOX SB16-55		
P	IRRIGATION BOOSTER PUMP MOUNT ON CONCRETE PAD (42"x54") FOR PUMP B AND PUMP C. PUMP A SHALL BE ON PAD FOR CHLORINATION EQUIPMENT PAD	BARRETT ENGINEERED PUMP	PUMP 1 (A): 15 HP, 208 VAC, 60 HZ, 45 AMPS PUMP 2 (B): 15 HP, 208 VAC, 60 HZ, 44 AMPS PUMP 3 (C): 5 HP, 208 VAC, 60 HZ, 31 AMPS	AVAILABLE FROM BARRETT ENGINEERED PUMPS, (619) 232-1861 SEE SPECIFICATIONS AND NOTES ON THIS SHEET	G / L-13
Y	WYE STRAINER	WILKINS	YB SERIES - 3"	INSTALL DOWN STREAM OF POINT OF CONNECTION AND PUMP	C / L-13
⊗	PRESSURE REGULATOR W/ WYE STRAINER	WILKINS	500 YSBR - 3"	PRESSURE REGULATOR ASSEMBLY CONSISTING OF 'Y' STRAINER WITH BLOW-OFF VALVE AND PRESSURE REDUCING VALVE. INSTALL IN VALVE BOX BELOW GRADE	
FM	HYDROMETER (COMBINED MASTER VALVE, METER AND FLOW SENSOR)	HYDROMETER	LHM12GT1-MEL	INSTALL IN VALVE BOX AND BELOW GRADE	G / L-14
⬢	RAIN SENSOR AUTOMATIC RAIN-SHUT OFF DEVICE	WCS	RAIN GUARD W/RGYR-S	RAIN SENSOR SHALL BE MOUNTED ON THE CONTROLLER CABINET PER LANDSCAPE ARCHITECT/MANUFACTURER'S SPECS.	E / L-13
⦿	QUICK COUPLING VALVE	RAINBIRD	33DLRC	ISOLATE FROM MAIN WITH 1" BALL VALVE	F / L-14
⦿	BALL VALVE	DURA	518 - SIZE AS PER PLAN	SIZED TO MATCH PIPE SIZE 1" FOR QUICK COUPLING VALVE. THE SAME SIZE AS THE LARGEST REMOTE CONTROL VALVE IN GROUP. INSTALL IN CONCRETE VALVE BOX.	B / L-14
▲	IRRIGATION REMOTE CONTROL VALVE (R.C.V.)	RAINBIRD	100 FEB-CP SERIES 150 FEB-CP SERIES 200 FEB-CP SERIES FRS-DIAL	1" ELECTRIC R. C. V. INSTALL IN VALVE BOX 1 1/2" ELECTRIC R. C. V. INSTALL IN VALVE BOX 2" ELECTRIC R. C. V. INSTALL IN VALVE BOX	A / L-14
	PRESSURE REGULATING MODULE	RAINBIRD			
⚠	DRIP CONTROL VALVE ASSEMBLY ELECTRIC REMOTE CONTROL VALVE (DOWN SLOPE)	RAINBIRD	XCZ-015-PRF	INSTALL PER MANUFACTURER	I / L-14 L / L-7
⚠	DRIP CONTROL VALVE WITH INLINE RBY FILTER (UP SLOPE)	RAINBIRD	LFV-015 RBY015MPTX	INSTALL PER MANUFACTURER	I / L-14 L / L-7
Ⓜ	DRIP END FLUSH VALVE	DURA	3/4" FPT X FPT	INSTALL AT THE END OF CIRCUIT.	D / L-13
Ⓐ	DRIP AIR RELEASE VALVE	NETAFIM	TLAYRV	INSTALL AT HIGHEST ELEV. IN CIRCUIT.	A / L-13
■	INLINE PRESSURE REGULATOR	RAINBIRD	PS1-M30X-015	INSTALL PER PLAN	
-----	IRRIGATION MAIN LINE (PRESSURE LINE)	---	1 1/2" AND SMALLER SCH. 40 PVC 2" AND LARGER CL315 PVC	18" DEEP, 24" MIN. UNDER PAVING. SIZE AS NOTED ON PLANS, SLEEVE WHEN UNDER PAVING.	D / L-14
-----	IRRIGATION LATERAL LINE PIPE (NON-PRESSURE)	---	SCH. 40 PVC UVR BROWN LINE	ON GRADE. 18" UNDER PAVING AND 30" UNDER UNPAVED ROADS REFER TO SPECIFICATIONS.	B / L-13 D / L-14 H / L-14
--- -- --	IRRIGATION MAIN LINE (PRESSURE LINE) FOR P.O.C. A FROM PUMP 'A' TO CROSSING AT ELEVATION 3,140.	---	SCH. 80 PVC WITH JOINT RESTRAINTS RATED MIN 200 PSI	LOCATE IN COMMON TRENCH WITH IRRIGATION MAIN LINE. CONTRACTOR SHALL PROVIDE AND INSTALL SCH. 80 PVC WITH JOINTS DESIGNED TO ACCOMMODATE 200 PSI PROVIDE PIPE JOINT RESTRAINTS AT EACH JOINT. PROVIDE 1 CU. FT. CONCRETE THRUST BLOCKS AT ALL ANGLES AND TEES.	--
-----	IRRIGATION PIPE/CONTROL WIRE SLEEVE	---	SCH. 40 PVC	INSTALL SLEEVE 24" DEEP UNDERPAVED ROADS. 36" DEEP UNDER UNPAVED ROADS.	D / L-14
FB	IRRIGATION ELECTRICAL FULL BOX	---	PLASTIC VALVE BOX USED AS A CONTROL WIRE FULL BOX	ALL SPICES SHALL OCCUR IN FULL BOX OR CONTROL VALVE BOXES LABEL BOX 'IRR FB'	--
NO SYMBOL	DIRECT BURIAL IRRIGATION ELECTRICAL CONTROL WIRE	---	12 GAUGE	INSTALL IN SAME TRENCH AS MAINLINE CONTROL WIRE SHALL BE INSTALLED IN SCH.40 PVC SLEEVE UNDER PAVING.	D, H / L-14

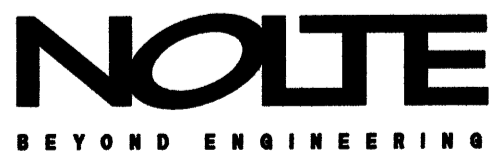
PROPOSED VALVE CALL OUT



TYPICAL QUICK COUPLER VALVE



NOTE:
CHECK VALVES SHALL BE INSTALLED AS NEEDED TO ELIMINATE ALL LOW HEAD DRAINAGE ON ALL IRRIGATION LATERAL LINE SYSTEMS USING KBI MODEL UCY (3/4 TO 1") OR SIZED TO MATCH LINE. CHECK VALVE IS ADJUSTABLE FROM 5 TO 14 PSI (12" TO 32" OF VERTICAL HEAD PRESSURE) AND SHALL BE SET BASED ON THE NEED AT EACH LOCATION. WHERE ELEVATIONAL CHANGE ON A LATERAL LINE EXCEEDS 30", INSTALL AN ADDITIONAL CHECK VALVE TO CONTROL FLOW AT ELEVATIONAL INTERVALS AS NEEDED TO COMPLETELY ELIMINATE LOW HEAD DRAINAGE. KBI SWING CHECK VALVES MAY BE SUBSTITUTED WHERE BACKFLOW IS OPPOSITE DIRECTION OF LATERAL LINE FLOW. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING CHECK VALVES AS NEEDED TO STOP LOW HEAD DRAINAGE AT NO ADDITIONAL COST.



REVISIONS

CONSTRUCTION DOCUMENTS

NO.	WORK DONE	DATE	BY	APP'D	NO.	WORK DONE	DATE	BY	APP'D	NO.	WORK DONE	DATE	BY	APP'D	NO.

SAN DIEGO GAS & ELECTRIC COMPANY
SAN DIEGO, CALIFORNIA

SUNCREST SUBSTATION
IRRIGATION LEGEND AND NOTES

DRAWN BY:	K.N.	DATE:	3/24/10	SCALE:	1"=30'	W.O.:	-	REV.:	-
CHECKED BY:	S.M.	DATE:	3/24/10						
APPROVED BY:	V.E.	DATE:	3/24/10						
CAD NO.:	511-04			PLOT SCALE:	1:1				

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